

2012 Davis-Monthan Water Quality Report

The 355th Bioenvironmental Engineering Flight (BEF) and the 355th Civil Engineer Squadron (CES) are pleased to present to you the 2012 Annual Water Quality Report for Davis-Monthan Air Force Base. This report, also known as the Consumer Confidence Report, is required by the Safe Drinking Water Act (SDWA) and is designed to provide details about where your water comes from, what it contains, and how it compares to standards set by regulatory agencies. This report will inform you about the quality water and services we deliver to you every day. Our mission is to provide you with a safe and dependable supply of drinking water.

Is my water safe?

Yes, your water is safe! Please continue reading below to get a detailed look at the Davis-Monthan drinking water program and what the D-M Drinking Water team does for you every day.

Where does my water come from?

Davis-Monthan AFB supplies drinking water to around 13,500 customers each and every day. This water is pulled directly from the Fort Lowell Aquifer via eight groundwater wells located across the base, and is monitored and maintained by personnel from the 355th Fighter Wing.

Source water assessment and its availability

All drinking water is chlorinated for disinfection purposes. Disinfection involves the addition of chlorine to kill bacteria and microorganisms that may be in the water. On a monthly basis, the 355th Bioenvironmental Engineering Flight monitors the base drinking water to ensure chlorination, acidity, and bacteriological contamination levels fall within an acceptable range. Additional sampling is performed on a periodic basis for other contaminants to ensure our drinking water remains compliant with safety regulations set by the Environmental Protection Agency (EPA).

Why are there contaminants in my drinking water?

As water travels across the surface of the land or dissolves through the ground it picks up naturally occurring minerals and, in some cases, naturally occurring radioactive materials. Additionally, it can pick up any number of substances resulting from the presence of animals or human activity. These range from viruses or bacteria found in water treatment plants and septic systems, inorganic and organic compounds either naturally occurring or as the result of industrial operations, and chemical contaminants such as pesticides and herbicides from farms. The EPA sets safety limits on these contaminants in public water systems in order to ensure safe drinking water is provided to the consumer.

Additionally, drinking water, including bottled water, may reasonably be expected to contain at least small amounts of some contaminants. The presence of contaminants does not necessarily indicate that water poses a health risk. More information about contaminants and potential health effects can be obtained by calling the Environmental Protection Agency's (EPA) Safe Drinking Water Hotline (800-426-4791) between 1000-1600 daily. A brief description of each contaminant detected in your water is included later in this report.

Do I need to take special precautions?

Some people may be more vulnerable to contaminants in drinking water than the general population. Immuno-compromised persons such as persons with cancer undergoing chemotherapy, persons who have undergone organ transplants, people with HIV/AIDS, the elderly and infants may be particularly at risk from infections. These people should seek advice about drinking water from their health care providers. In addition EPA/Centers for Disease Control (CDC) guidelines on appropriate means to lessen the risk of

infection by *Cryptosporidium* and other microbial contaminants are available from the Safe Water Drinking Hotline (800-426-4791).

How can I get involved?

We would like you to understand the efforts we make to continually improve the water treatment process and protect our water resources. The Davis-Monthan Drinking Water Quality Program team members are committed to ensuring your water remains as clean as possible. If you would like additional information concerning this report, or if you have any questions about our drinking water program, please feel free to contact the Davis-Monthan Drinking Water team members directly and we will be happy to assist you in any way we can. The Bioenvironmental Engineering Flight can be reached directly at 520-228-5369. In addition the Civil Engineer Customer Service desk is available by calling 520-228-5503. They can help direct you to who would best be able to answer your questions.

Water Quality Data Table

In order to ensure that tap water is safe to drink, the EPA prescribes regulations which limit the amount of contaminants allowed in water provided by public water systems. The table below lists all of the drinking water contaminants that we detected during the calendar year of this report. Although many more contaminants were tested, only those substances listed below were found in your water. All sources of drinking water contain some naturally occurring contaminants. At low levels, these substances are generally not harmful in our drinking water. Removing all contaminants would be extremely expensive, and in most cases, would not provide increased protection of public health. A few naturally occurring minerals may actually improve the taste of drinking water and have nutritional value at low levels. Unless otherwise noted, the data presented in this table is from testing done in the calendar year of the report. The EPA or the State requires us to monitor for certain contaminants less than once per year either because the concentrations of these contaminants do not vary significantly from year to year or the system is not considered vulnerable to this type of contamination. As such, some of our data, though representative, may be more than one year old. In this table you will find terms and abbreviations that might not be familiar to you. To help you better understand these terms, we have provided the definitions in the last two tables.

Detected Contaminants Table

<u>Contaminants</u>	<u>MCLG</u>	<u>MCL</u>	<u>RAA</u>	<u>Range</u>		<u>Sample Date</u>	<u>Violation</u>	<u>Typical Source</u>
Disinfection By-Products								
(There is convincing evidence that addition of a disinfectant is necessary for control of microbial contaminants)								
Total Trihalomethanes [TTHMs] (ppb)	None	80	5.7	2.21	7.65	2012	No	By-product of drinking water disinfection
<u>Contaminants</u>	<u>MCLG</u>	<u>MCL</u>	<u>Your Water</u>	<u>Range</u>		<u>Sample Date</u>	<u>Violation</u>	<u>Typical Source</u>
Inorganic Contaminant								
Arsenic (ppb)	0	10	2.6	1.2	2.6	2012	No	Erosion of natural deposits, run offs
Barium (ppm)	2	2	0.074	ND	0.074	2012	No	Erosion of natural deposits, industrial use

Sodium (ppm)	None	None	32	30	32	2012	NA	Erosion of natural deposits
Nitrate [measured as Nitrogen] (ppm)	10	10	1	ND	1	2012	No	Runoff from fertilizer use; Leaching from septic tanks, sewage; Erosion of natural deposits
Radioactive Contaminant								
Alpha emitters (pCi/L)	0	15	2.5	0.1	2.5	2012	No	Erosion of natural deposits
Uranium (pCi/L)	0	30	3.6	0.6	3.6	2012	No	Erosion of natural deposits
<u>Contaminants</u>	<u>MCLG</u>	<u>AL</u>	<u>90th percentile</u>	<u>Sample Date</u>	<u># Samples Exceeding AL</u>		<u>Typical Source</u>	
Inorganic Contaminant								
Copper - action level at consumer taps (ppm)	1.3	1.3	0.13	2012	0		Corrosion of household plumbing systems; Erosion of natural deposits	
Lead - action level at consumer taps (ppb)	0	15	0	2012	0		Corrosion of household plumbing systems; Erosion of natural deposits	
<u>Contaminant</u>	<u>Year Sampled</u>	<u>Annual Average</u>	<u>Monthly Average Range</u>		<u>MRDLG</u>	<u>MRDL</u>	<u>Source</u>	
Chlorine (ppm)	2012	0.68	0.33 – 0.96		4	4	Disinfection additive used to control microbes	

Monitoring and reporting of compliance data violations

Each month, members of the Bioenvironmental Engineering Flight collect 10 Total Coliform Bacteria drinking water samples to monitor for microbiological contamination throughout the system. In the month of November, our water system received a monitoring violation for not ensuring all 10 routine Total Coliform Bacteria compliance samples were received by the ADEQ. All 10 samples were collected, analyzed, and received by our office in a timely manner. All 10 samples were negative for microbiological contamination and no adverse health effects would have been a result of this monitoring violation. Our office used a third party contract laboratory to analyze our samples and submit our compliance results to the ADEQ each month. This notice resulted because only half of the results were submitted for November. The remaining results were sent to the ADEQ immediately following the notice of violation. Upon completing a 2 month monitoring violation period, the violation was closed out in January 2013. Since January 2013, our office has set up a process to QA/QC the results prior to them being sent to the ADEQ and retains confirmatory e-mails once the results are received by the ADEQ.

Undetected Contaminants Table

The following contaminants were monitored for, but not detected, in your water.

<u>Contaminants</u>	<u>MCLG</u>	<u>MCL</u>	<u>Your Water</u>	<u>Violation</u>	<u>Typical Source</u>
Disinfection By-Products					
(There is convincing evidence that addition of a disinfectant is necessary for control of microbial contaminants)					

Haloacetic Acids [HAA5] (ppb)	None	60	ND	No	By-product of drinking water disinfection
Inorganic Contaminant					
Cyanide [as Free Cn] (ppb)	200	200	ND	No	Discharge from plastic and fertilizer factories; Discharge from steel/metal factories
Fluoride (ppm)	4	4	ND	No	Erosion of natural deposits
Nitrite [measured as Nitrogen] (ppm)	1	1	ND	No	Runoff from fertilizer use; Leaching from septic tanks, sewage; Erosion of natural deposits
Radioactive Contaminant					
Radium (combined 226/228) (pCi/L)	0	5	ND	No	Erosion of natural deposits
Beta/photon emitters (mrem/yr)	0	4	ND	No	Decay of natural and man-made deposits
Contaminant	MCLG	MCL	Highest monthly # of positive samples	# of Samples per month	Typical Source
Microbiological					
Total Coliform Bacteria (positive samples/month)	0	1	0	10	Naturally present in the environment

Unit Descriptions	
Term	Definition
ppm	ppm: parts per million, or milligrams per liter (mg/L)
ppb	ppb: parts per billion, or micrograms per liter (µg/L)
NA	NA: not applicable
ND	ND: Not detected
NR	NR: Monitoring not required, but recommended.

Important Drinking Water Definitions	
Term	Definition
AL	AL: Action Level: The concentration of a contaminant which, if exceeded, triggers treatment or other requirements which a water system must follow.
MCL	MCL: Maximum Contaminant Level: The highest level of a contaminant that is allowed in drinking water. MCLs are set as close to the MCLGs as feasible using the best available treatment technology.
MCLG	MCLG: Maximum Contaminant Level Goal: The level of a contaminant in drinking water below which there is no known or expected risk to health. MCLGs allow for a margin of safety.
MNR	MNR: Monitored Not Regulated
MPL	MPL: State Assigned Maximum Permissible Level

MRDL	MRDL: Maximum residual disinfectant level. The highest level of a disinfectant allowed in drinking water. There is convincing evidence that addition of a disinfectant is necessary for control of microbial contaminants.
MRDLG	MRDLG: Maximum residual disinfection level goal. The level of a drinking water disinfectant below which there is no known or expected risk to health. MRDLGs do not reflect the benefits of the use of disinfectants to control microbial contaminants.
RAA	RAA: Running Annual Average

Detailed Information on Contaminants

Haloacetic Acids (HAA5) are a group of chemicals that are formed along with other disinfection by products when chlorine or other disinfectants used to control microbial contaminants in drinking water react with naturally occurring organic and inorganic matter in water. The regulated haloacetic acid compounds, known as HAA5, are monochloroacetic acid, dichloroacetic acid, trichloroacetic acid, monobromoacetic acid, and dibromoacetic acid. USEPA has established an MCL of 60 parts per billion for HAA5. Compliance with the HAA5 standard is based on the running annual average concentration.

Total Trihalomethanes (TTHMs) are formed when chlorine combines with naturally occurring organic material in water. Since the level of organic matter in our groundwater is extremely low, these compounds are found at very low concentrations. The compounds which make up the TTHMs include bromodichloromethane, bromoform, chlorodibromomethane, and chloroform. Compliance with the TTHM standard is based on the running annual average concentration.

Arsenic is a naturally occurring substance commonly found in groundwater in the southwestern United States. While your drinking water meets USEPA's standard for arsenic, it does contain low levels of arsenic. USEPA's standard balances the current understanding of arsenic's possible health effects against the cost of removing arsenic from drinking water.

USEPA continues to research the health effect of low levels of arsenic which is a mineral known to cause cancer in humans at high concentrations and is linked to other health effects such as skin damage and circulatory problems.

Barium occurs naturally at very low concentrations in our groundwater.

Fluoride is an important naturally occurring mineral that helps to form healthy teeth and bones. A concentration of 1 ppm is considered optimum. At concentrations above 2 ppm, fluoride can cause mild discoloration of teeth, and exposure at above the MCL of 4 ppm can cause both severe discoloration of teeth and over many years of exposure, bone disease.

Nitrate is a form of nitrogen and an important plant nutrient. Nitrate in drinking water at levels above 10 ppm is a health risk for infants less than six months of age. High nitrate levels in drinking water can cause blue baby syndrome. Nitrate levels may rise quickly for short periods of time because of rainfall or agricultural activity. If you are caring for an infant, ask advice from your health care provider.

Sodium is the sixth most abundant element on Earth and is widely distributed in soils, plants, water, and food. A goal of 2300 mg/day dietary sodium has been proposed by several government and health agencies. Drinking water containing between 30 and 60 ppm would contribute only 2.5 % to 5% of the dietary goal if tap water consumption is 2 liters per day. Currently, there is no MCL for sodium in

drinking water. The recommended EPA guidance level for individuals on a very low sodium diet (500 mg/day) is 20 ppm in drinking water.

Alpha emitters are a measure of radioactivity due to naturally occurring minerals in groundwater. This excludes the radioactivity contributed by either radon or uranium.

Radium 226 and 228 are two of the most common radium isotopes. Radium is a naturally occurring radionuclide, formed by the decay of uranium or thorium in the environment. It occurs at low concentrations in virtually all rock, soil, water, plants, and animals.

Uranium is a metallic element which is highly toxic and radioactive.

Lead and Copper are naturally occurring metals which are generally found at very low levels in source waters. If present, elevated levels of lead can cause serious health problems, especially for pregnant women and young children. Lead sources in drinking water are primarily from materials and components associated with service lines and home plumbing. The BEF is responsible for providing high quality drinking water, but cannot control the variety of materials used in plumbing components. If water in your home has been sitting for several hours, you can minimize the potential for lead exposure by flushing your tap for 30 seconds to 2 minutes before using water for drinking or cooking. If you are concerned about lead in your water, you may wish to have your water tested. Information on lead in drinking water, testing methods, and steps you can take to minimize exposure is

available from the Safe Drinking Water Hotline or at <http://www.epa.gov/safewater/lead>.

The required lead and copper monitoring was performed during 2012. The 90th percentile value was 0 ppb for lead (Action Level is 15 ppb) and 0.13 ppm for copper (Action Level is 1.3 ppm). No sample was above the action level for lead. There were no samples above the action level for copper either.

Chlorine Residual Disinfection is maintained throughout the distribution system. Chlorine is added to the drinking water supply at well sites to provide assurance that water delivered to customers will remain free of microbiological contamination. This also ensures that the water meets microbiological drinking water standards from the time it is pumped from the ground until it reaches the customer's tap. Chlorine Residual Disinfectant is measured five days a week from each well and monthly from the sample stations where the bacteriological samples are collected. The annual chlorine residual disinfectant is calculated using the monthly chlorine averages for the past 12 months. The annual average for twelve months of 2012 was 0.68 ppm. The range for 2012 was 0.33-0.96 ppm. (The Maximum Residual Disinfectant Limit or MRDL is 4 ppm.)

Total Coliform Bacteria are commonly found in the environment and in the digestive tract of animals. While rarely harmful, coliform bacteria in drinking water are indicators that the water may also contain harmful microorganisms. In 2012, there were zero positive total coliform samples for the entire year. (The MCL is 1 per month.)

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